

A Property-Rights Approach to Understanding Regulations and Practices in Community-Based Forest Management: Comparison of Three Systems in the Philippines

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Abstract Decentralizing property rights from state control to user communities has encouraged people's participation in forest management. Relatively few studies, however, examine the forest regulations required for exercising such property rights. To address this issue, Schlager and Ostrom's 'bundle of rights' framework was used to examine various forms of property rights and regulations in three systems of community-based forest management. The field research was undertaken in the northern Philippines, using eight cases of community-based forest management at sites in the provinces of Nueva Vizcaya and Ifugao. Local communities were found to informally retain the authority to create locally crafted property rights and regulations in a central government-initiated program. While forest regulations and practices prescribed at the national level have improved forest conditions, the flow of forest benefits to communities has been limited because of decentralization without devolution of authority. A case study of a site initiated by a local government indicated that the transfer of responsibility from the central government to local government units can create more favourable conditions for the flow of forest benefits to communities. But due to a lack of clarity about devolution of cutting permits and about the locations of afforested critical watershed areas, authorized local users lose their authorization. When forest is managed traditionally, communities can have more assured rights than in government-initiated programs, particularly in relation to tree ownership. This is because individuals have the authority to devise collective-choice rights as well as operational rights.

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Introduction

Devolution of forest governance in developing countries has become increasingly common in the past few decades (Balooni and Inoue 2007). This approach, which is for example called community forestry in Nepal, joint forest management in India and community based forest management (CBFM) in Philippines, creates opportunities for forest communities to participate in managing state forest land by transferring forest use rights and management authority to communities (Charnley and Poe 2007). Property rights systems differ depending on provisions from government policies, programs implementing them, members of society involved, and rules or agreements (ITTO 2011). Relatively few studies, however, consider the forest regulations required to obtain the right to use forest resources (Pulhin et al. 2010). To pursue this issue further, the conceptual framework from the political economy literature is applied to examine the role of regulations on property rights.

The study focuses on the Philippines because it is one of the most advanced countries in terms of decentralization and the CBFM area covers about 5.97 M ha (37.64 %) of the 15.86 M ha total forest land area (Balooni et al. 2008). A major approach to decentralization involves decentralization with devolution of forest management to upland communities using community-based forest management agreements (CBFMAs) issued by the Department of Environment and Natural Resources (DENR), devolution to local government units (LGUs) using co-management agreements, and devolution to indigenous people issuing certificates of ancestral domain title (Guiang et al. 2008). Under CBFMAs and co-management schemes, organized communities called people's organizations (POs) obtain 25-year renewable leases on state forest land, while certificates of ancestral domain title grant land title rights to indigenous people (Charnley and Poe 2007; Pulhin et al. 2008). Besides such statutory systems, there is a customary tenure system determined at the local level in accordance with oral agreements which has been practiced for many generations, e.g. the *muyong* (forest or woodlot system involving assisted natural regeneration) in Ifugao (Butic and Ngidlo 2003). Some scholars, including Borlagdan et al. (2001) and Pulhin and Inoue (2008), have recommended enhancement of customary tenure systems.

A number of research studies have been conducted about CBFM. Initial studies focused on historical reviews of forest management and trends in the social forestry movement (e.g. Kummer 1992; Gauld 2000; Pulhin and Pulhin 2003). Some studies have identified the positive contributions of CBFM, including increased forest cover by reforestation and reduced timber poaching (e.g. Pulhin et al. 2008). Most recent research has analyzed devolution policies (e.g. Dahal and Capistrano 2006; Pulhin and Inoue 2008; Guiang et al. 2008). Despite these studies analyzing the effectiveness of devolution policies, limited attention has been directed from the perspective of property rights, and there are few comparative empirical examinations of statutory and customary tenure systems. Dahal and Capistrano (2006)

Table 1 Bundle of rights associated with positions in relation to forest resources (adapted from Schlager and Ostrom 1992)

Bundle of rights	Position			
	Owner	Proprietor	Claimant	Authorized user
Access and withdrawal	×	×	×	×
Management	×	×	×	
Exclusion	×	×		
Alienation	×			

found that property rights are one of the main issues requiring attention in order to achieve desired policy outcomes. Also required to address and improve property rights is a review of regulations and practices that restrict afforestation, and finding means that can improve those restrictive rules (Harrison 2003).

This paper attempts to address three research questions: 1. What are the individual and collective property rights held by communities? 2. What regulations and practices restrict property rights and what is the impact of those regulations on forest resources and socioeconomic conditions of communities? 3. What possible ways are there to improve CBFM policies with emphasis on property rights? To answer these questions, two types of government-initiate programs and one traditional forest management (TFM) system were examined.

Theoretical Background

The property right regime is one of the salient aspects of forest governance for achieving the desired policy objectives of people participation in forest management (Agrawal and Ostrom 2001; Pagdee et al. 2006; Nagendra and Gokhale 2008). Property rights can be defined as ‘the relationship between the right holder and all others in respect to something of value’ (Kitla 2008, p. 20).

As Schlager and Ostrom (1992) noted, property right holders can be classified into four groups: authorized users, claimants, proprietors and owners (Table 1). Authorized users possess rights of access (right of entry to a resource) and withdrawal (rights to harvest forest products), which are also called operational-level rights. Claimants possess the operational rights and management rights (authority to regulate the use pattern and make improvements). Proprietors hold the same rights as claimants, and in addition the right of exclusion (right to determine who may access and harvest a resource), while owners possess the right of alienation (the right to sell or lease management and exclusion).

Property rights can be de jure rights granted by government officials or de facto rights originated among resources users (Dorji et al. 2006). When communities are given common property rights by the state through various tenures, tenure systems not only define the bundle of rights but also the rules that require particular actions in exercising those property rights (ITTO 2011). Thus, rules may be de jure rules enforced by officials and de facto rules defined by communities (Gibson et al. 2005).

Ostrom and Agrawal (1999) observed that there are three levels of rules determining rights and regulations in devolution of forest governance. Operational rights are determined by operational rules such as quantity of resource use, harvesting technology, and timing of harvests. These operational rules are devised by those who hold collective-choice rights of management and exclusion by collective actions (Schlager and Ostrom 1992). Such actions are undertaken under a set of collective-choice rules that determine who may participate in making rules and the level of agreement required to make or change the rules (FAO 1997; Schlager and Ostrom 1992; Agrawal and Ostrom 2008). The powers and authority of collective choice right-holders are defined by constitutional rules including rules on how persons holding collective choice decision are selected (FAO, 1997). In relation to forestry, ‘regulations are rules prescribed to control the use of forest resources and to assure that the management of these resources conforms to government-defined standards’ (Fay and Michon 2003, p. 11).

Previous literature—including Agrawal and Ostrom (2001), Nagendra and Gokhale (2008) and Thomas (2008)—indicates that forest conditions in India and Nepal have considerably improved because of the ability of right holders to exclude other potential users, coupled with internal rule enforcement and sanctioning. There is a close relationship between flexible management approaches that fit local ecological and social conditions, and improvement of forest conditions. In order to change forest conditions or the relationships between state and community actors, communities require not only operational-level rights but also collective-choice rights to make collective-choice decisions (Agrawal and Ostrom 2001). In practice, the authority to make operational rules is retained by higher-level actors, which also influences the flow of forest benefits to communities (e.g. Larson et al. 2010). Although there is much literature on analyzing property rights in the context of decentralization, few studies have considered the nature of regulations on using forest resources (Pulhin et al. 2010), and understanding the level of decision-making is important to achieve the outcomes of decentralized forest management (Agrawal and Ostrom, 2008). This study therefore focuses on analyzing the bundle of forestry property rights as well as three levels of rules using the analytical tool of Schlager and Ostrom (1992).

The Study Area

Nueva Vizcaya and Ifugao Provinces were selected for central and local government-initiated programs and the traditional forest management system respectively (Fig. 1). DENR data reveal that Nueva Vizcaya has more tenured area (i.e. more CBFMAs and beneficiaries) than most other provinces in the Philippines (DENR 2009). In addition, Nueva Vizcaya is well known for initiating co-management agreements between the LGUs and the communities. Support personnel availability during field research is another criterion for study site selection. Central and local government initiated CBFM sites were selected in consultation with University of Los Baños academics, NGO personnel, and DENR and LGU personnel. Regarding TFM systems, the Municipality of Banaue in Ifugao Province was selected because of its

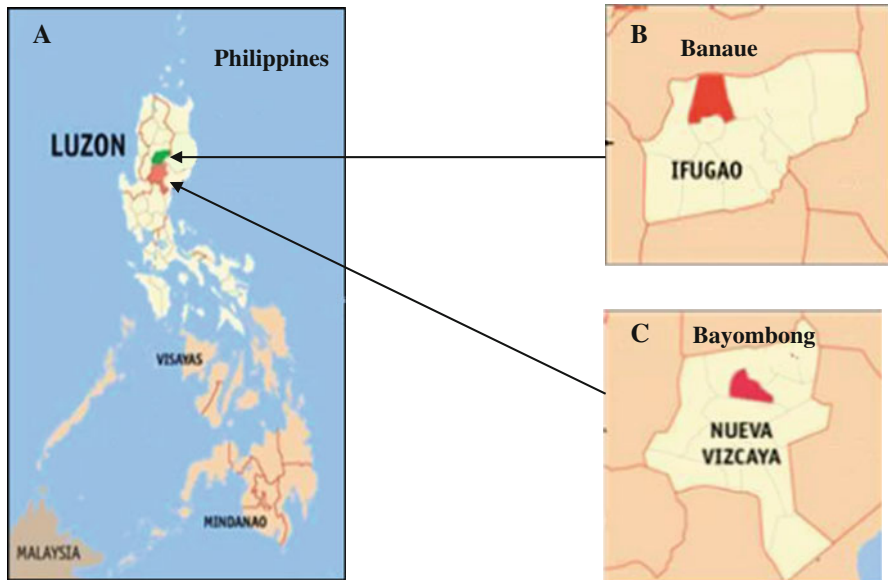


Fig. 1 Location of study sites. **a** Ifugao and Nueva Vizcaya; **b** Banaue in Ifugao; and **c** Bayombong in Nueva Vizcaya

successful traditional forest management described by Borlagdan et al. (2001) and Butic and Ngidlo (2003). To enrich understanding of CBFM issues, eight CBFM sites consisting of three central government-initiated programs (CGIPs), three local government initiated programs (LGIPs) and two traditional barangay (village) forest management systems were visited.

Based on preliminary survey, the federation of Vistahills, Kalongkong and Kakilingan Upland Farmers Associations (a DENR/ITTO-initiated site), Barobbob Watershed Association (an LGU-initiated site), and TFM systems in two barangays were purposely selected for case studies to compare the extent of property rights accorded by government CBFM policies with the traditional bundle of rights inherited from ancestors. The ability to observe and analyze regulations and practices that restrict property rights, particularly for harvesting trees, was the main selection criterion. Other selection criteria were site proximity to market, over 10 years of experience in CBFM implementation, availability of secondary data about the communities and forest management activities, and accessibility.

Research Method

A preliminary survey was conducted at eight CBFM sites of CGIP, LGIP and TFM systems to collect necessary information through interview with DENR and LGU personnel, PO leaders and muyong owners. Based on the data collected in a preliminary survey and secondary documents, semi-structured questionnaires were separately prepared for each system. The sample included 111 households from nine

*sitios*¹ (coded A to I), comprising three sitios (A, B, C) from CGIP, two sitios (D, E) from LGIP and four sitios (F, G, H, I) from TFM, randomly selected to collect data on demographics, property rights, income from selling crops and fruit trees, numbers of trees on farms, numbers and purposes of harvested trees, and rules and regulations on tree harvesting. Households located inside CBFM area were also visited, to observe forest conditions and conduct interviews. To assess the rules enforced by each institution, the logic behind crafting these rules and the forest conditions in communal areas, key informant interviews of eight persons were conducted. Data were counter-checked through informal interviews with 33 persons. The respondents are from DENR central office, DENR Provincial Environment and Natural Resource Offices (PENROs), Community Environment and Natural Resource Offices (CENROs), Provincial Government Environment and Natural Resources Offices (PGENROs), barangay officers, PO leaders and elderly persons who have muyong. Property rights regimes were analyzed using the framework of Schlager and Ostrom (1992). Almost all departmental orders, executive orders and memoranda related to operational rules defined at the national, local administrative and community levels were analyzed to determine the regulations and practices defining property rights in selected CBFM sites. The following sections briefly explain the nature of three CBFM systems.

Central Government Initiated Program (CGIP)

The federation of Buenavista comprises three POs of upland *sitios*: A, B and C. *Sitio* A is located adjacent to an area of CBFM while B and C are located inside a CBFM area. The CBFM tenure was awarded to the federation including ITTO-funded plantation areas and residual dipterocarp forests, for the purpose of protecting forests with the community's help in accordance with CBFM policy in 1999. Among the total area of 3,000 ha, land not owned by individuals became the federation's communal area, which is estimated to be 1,500 ha of residual forest, while areas of about 50 ha, 100 ha, and 80 ha are under the associations A, B, and C, respectively. Generally, PO members from B and C are migrants from other provinces and they practice agroforestry instead of establishing tree plantations in their individual lots because cropping is their main livelihood. In contrast, the majority of forest occupancies by A are contract labourers under the Family Approach to Reforestation program which was implemented in 1981 and they claimed the local land and occupied the reforestation area. But they do not rely on crop production for their primary means of livelihood because they have rice field in the lowlands (less than 1,000 m elevation) as well as other income sources. When the DENR-ITTO project commenced in 1995, community organizers explained the sharing arrangement for the government-funded plantation area, and the local people accepted it.²

¹ A sitio is a sub-unit of a barangay (village).

² For government-funded plantations, 75 % of the gross income from sale goes to the PO while 25 % goes to the government to pay back the loan from the Asian Development Bank and sustain government efforts in reforesting denuded forestlands (Department of Environment and Natural Resource (DENR) 1998). PO members are in turn required to share 25 % of their share with the federation, 25 % with the

Local Government Initiated Program (LGIP)

In Nueva Vizcaya, Barobbob is one of the major watersheds supplying drinking water and irrigation water. It is the headwater of the Magat River, which feeds the Magat Multipurpose Dam for irrigation and hydropower. It is also home to a local community of about 151 households which depend on upland farming. Over 50 % live within the watershed called sitio E, while others live in the area adjacent to the watershed, Sitio D. As a part of the devolution initiative under the 1992 local government code, the DENR (represented by the Regional Executive Director) devolved about 439 ha of Barobbob watershed area to the Nueva Vizcaya provincial government in 1993. Instead of persuading local occupants to be resettled into other areas, the provincial government and local community entered into a co-management agreement by awarding Memorandum of Agreement (MOA) to those settlers of sitios E and D which are organized into a PO named in Barobbob Watershed Association (BOWA).

Traditional Forest Management (TFM) System

In the Ifugao dialect, *muyong* means ‘forest’ and if the forest is owned privately it is called ‘private *muyong*’, or *pinugu* in the Ifugao language, while the forest managed as communal property is called ‘communal *muyong*’, or *hinugu* in the Ifugao language. This communal practice is also known as the *ala-a* system. Although there are no records of when the practice of maintaining *muyong* began, interviews with elderly people indicated that it had been practiced since before the 1950s. The DENR and JICA study (2004) reported that *muyong* have been privately managed for at least three generations even though the areas fall within state-owned forest land. According to Borlagdan et al. (2001), most private *muyong* are located in the upper portion of agricultural plots and *payoh* (rice fields). The idea is that there will be no water for rice fields without trees.

Individual and Collective Property Rights in Three Systems

The CGIP awards the CBFMA tenure to the federation to develop, protect, manage and use the whole CBFM forest land area and resources on a sustainable basis. Under this mother tenure, Certificate of Stewardship Contract (CSC) tenure for communities which act as stewards of the land was issued for individually owned property. PO members who are CSC recipients have the rights to possess, manage and cultivate the land. They are also allowed to sell or transfer CSCs to people who live within the CBFM project area (DENR 1998). Because of this recognition of individual property, all respondents answered that they have strong rights to exclude outsiders from using resources on that land.

Footnote 2 continued

association, and 5 % with the barangay because the federation considers individual farm lots to be under the stewardship of the farm lot owner, association and federation.

For communal property, the federation and three associations possess rights of access, withdrawal, management, and exclusion of non-members from using resources. The issuance of a CBFMA gave secure exclusion rights to the federation, and the CBFM policy granted full management rights for the development of forest areas. If non-members illegally cut trees or grow crops inside CBFM areas, the federation settles the offense with the collaboration of barangay officers.

Local government initiated programs grants the individual PO members the rights to develop the land, utilize the products, and exclude others. As indicated in MOAs approved by the Provincial Government and confirmed by the DENR, land-right holders can transfer or mortgage their MOAs in the event that money is badly needed for hospitalization. Like PO members in CGIP, they also have full management rights to decide how, when and what resource use will take place in the future. Under the co-management scheme, however, the communal forest areas are jointly managed by PGENRO and BOWA, which jointly hold the operational level rights of access. There is no communal tenure granted to BOWA to define exclusion rights.

In the context of TFM, the nature of ownership varies considerably depending on the type of *muyong*—private, clan-owned or communal. All clan members are granted the bundle of rights as long as no specified person owns the land. In the case of private *muyong*, only the heir has the full bundle of rights, while either family members or clan members are allowed to access and harvest the trees after asking permission from the heir, particularly for home construction. With regard to alienation rights, the first child is more likely to inherit land or other property according to custom because it is assumed that the first and second children will care for their aged parents. The third or fourth child may inherit property that was added as new property by parents, or they may not inherit if the parents have only a small area of *payoh* (rice fields) or *muyong* land.

Nowadays, some *muyong* owners have altered this traditional concept of inheritance as some children are not interested in *muyong* because of urbanization or migration. Thus, they will likely consider the degree to which their children want to inherit *muyong*. Under TFM, selling customary land to someone outside is prohibited because Ifugao people emotionally value property inherited from their grandfathers so it is shameful to sell. In the event one must sell, the clan should have first right of purchase because property from one's forefathers should be kept within the family or clan.

Nature of Regulations and Practices in Three Systems

The nature of the regulations and practices operating in the process of obtaining permits varies across the three systems. The operational rules enforced by CGIP are created at the national and local levels. To exercise *de jure* withdrawal right for plantation forest that is subject to forestry tenure instruments including CBFMA and CSC, the state crafted operational rules, but the authority was devolved to the Regional Environment and Natural Resource Office (RENRO). In accordance with these rules, communities in CGIP are required to submit: 1) an agreement letter which signifies the interest of individual landholders in harvesting trees, 2) the

Community Resource Management Framework (CRMF) and five-year work plan, 3) a total inventory of trees, 4) an Environmental Compliance Certificate, 5) a list of Criteria and Indicators for performance evaluation for the concerned CENRO, and 6) a clearance from the barangay chairman or municipal or provincial governor (DENR Region II, Cagayan Valley 2008). Determining the operational rules related to exercising de jure withdrawal rights to wild trees, Executive Order 23 imposes restrictions on cutting naturally grown trees in all natural and residual forest areas with the aim of allowing natural regeneration and development of plantation forests.

Aside from these de jure operational rules crafted at the national level, there are de facto rules created by the Federation of the three sitios (associations) as well as each association, the federation's constitutional law allowing it to develop its own operational rules, e.g. rules on planted trees and wild trees in each Association, and for charcoal-making in Association C. In order to monitor enforcement of locally crafted operational rules, all three Associations have formulated their own sanctions. The reason for regulating cutting of planted trees is to conserve the environment (secretary of Association C), to legitimize and control cutting and to obtain funds for buying supplies such as pens and notebooks (secretary of Association B), and to keep the number of trees constant for sharing benefits with the government because tree plantations are funded by the government (local forester from Association A). The federation president stated that the local DENR office (CENRO) verbally agreed to these rules because officials believed that the federation will not abuse its power.

In the case of LGIP, there are no operational rules enforced at the national level. Instead, by virtue of the Local Government Code 1991, the provincial governor crafted operational rules to enforce a de jure withdrawal right of PO members to extract planted trees in 2007. To exercise these rights, PO members must: 1) send a request letter to the BOWA president, 2) have the BOWA president send an endorsement letter to the PGENRO, 3) obtain certification from the BOWA president, 4) obtain certification from the barangay chairman that trees are within the production zones, 5) obtain an inspection report signed by the concerned PGENRO and DENR, and 6) submit a PGENRO recommendation to the governor for the approval of a permit.

In practice, land managers cannot legally use and sell forest products because the resource use permit legal process stops after the tree inventory by PGENRO and DENR personnel. Under the harvesting guidelines approved by the provincial governor, the governor is authorized to issue resource use permit. Nevertheless, there is no legal document which authorizes the governor to approve permits at the national level, although a document of devolved forest management functions clearly states that the power to issue permits to 'operate sawmills and to transport timber, lumber, and other forest products was not shared' and is held exclusively by DENR (DENR 1999, p.13). As such, DENR does not want to devolve the power to issue resource use permits. Another reason is that the Barobbob watershed is a critical watershed area which requires protection.³ However, Executive Order 318 issued in 2004 and guidelines for CBFM projects within watershed reservations

³ Barobbob watershed is a proclaimed watershed area covered by the National Integrated Protected Areas System (Act of 1992), and is therefore excluded from logging and other operational activities.

state that non-timber species, abandoned logs, fallen timber, dead trees, planted timber species, and lesser-used species may be extracted (Department of Environment and Natural Resource (DENR) 1998).

Unlike the CGIP where PO members have authority to determine *de jure* and *de facto* operational rules, the PO members in LGIP cannot make such rules, and management of the watershed reforestation is driven by the PGENRO (Multi-sectoral Protection Committee 2009).

In the TFM system, muyong owners can make collective decision to devise operational rules. There were no internal or external regulations until 1996. Trees are harvested for firewood, home consumption and woodcarvings. After 1996, however, the muyong guidelines defined by the state imposed restrictions on forest resource use such as prohibiting clear cutting, banning the cutting of pine trees, requiring the planting of 10 seedlings for every tree cut, and requiring that all resources harvested are processed within the municipality.⁴ The state devolved the authority to the PENRO to issue muyong resources permit with the recommendation of the concerned CENRO. *De jure* requirements for muyong resources permit—including location of muyong, number of trees, certification from the barangay captain, and amount of raw material needed for wood carvings—are defined by the state.

Impact of Regulations on Forest Resources

Case studies in CGIP reveal that the number of trees to be planted is not regulated at either the community or national level provided PO members develop the allocated land using sound ecological practices. Therefore, the average number of trees per household is largest in sitio A where farm lots are covered with forest plantations funded by government reforestation projects. Sitios B and C where mostly crops are grown, have fewer trees than sitio A. Of these three sitios, C has the least trees (Table 2). It might be that its association formulated *de facto* rules which allow making charcoal (a major product for subsistence livelihoods), and selling timber is occasionally a coping mechanism for respondents when money is urgently needed, e.g. for hospital fees. In sitio B the trees are cut only for home consumption because people have regular income sources, including mining; selling timber is rare and the trees are larger than in C.

In the communal property area of CGIP, the Federation regulates individual harvesting while the state regulates cutting indigenous trees to conserve the residual forest area. Interviews revealed that harvesting of trees from the communal area was limited to a few respondents collecting fuelwood. Trees are extracted for communal purposes, examples being building a school in sitio B and building a daycare centre in C. Because of strong exclusion right enforced by cooperation among barangay officers, forests are well protected and maintained in the communal area (focus

⁴ The guidelines for MRP do not specify why cutting pine trees is prohibited. In accordance with Calub (2005) and DENR Administrative Order 21 issued in 2000, benguet pine trees are classified as one of the premium hardwood species, for which harvesting and utilization is regulated, even on titled private land. Hence, DENR may want to conserve pine trees whether planted or wild.

Table 2 Frequency distribution of number of trees per household

System	Village	Average number of trees per household	Tree number range															
			≤100		101–700		701–1,300		1,301–1,900		1,901–2,400		2,401–3,000		3,001–3,600		3,601–4,200	
			No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
CGIP	A	705	–	–	13	62	7	33	1	5								
	B	429	10	63	3	19	1	6	1	6				1		6		
	C	204	5	38	7	54	1	8										
LGIP	D	702	4	31	8	61											1	8
	E	325	12	67	3	17	2	11							1	5		
	F	865	–	–	4	50	1	12	1	12	1	12	1	12				
TFM	G	677	–	–	2	67	1	33										
	H	468	–	–	9	90			1	10								
	I	452	–	–	7	78	1	11	1	11								

group discussion with barangay officers, 2011). According to an inventory carried out in 2010, 3,891 planted trees (about 1,875.55 m³) will be available to harvest from the communal area of the three associations (CENRO 2011).

Like PO members in CGIP, PO members in LGIP have the right to manage the land by planting any suitable crops, fruit trees or forest trees. In sitio D, 50 % of respondents' farm lots are covered with DENR watershed reforestation projects, so the average number of trees is the second largest among the two government-initiated programs. In sitio E, a few members had already harvested and sold trees. Interestingly, two logging workers who remained in BOWA after the logging ban planted more trees and conserved more wild trees than new migrants. Sitio E therefore has more trees than C, although there are fewer households that planted trees than in B and C (Table 2).

Under the co-management scheme, communal forests are managed jointly and there is no tenure granted for the whole watershed, so the exclusion right is not as strong as in the CGIP. Moreover, no local policies were created by PO leaders to manage the whole watershed (Multi-sectoral Protection Committee 2009). Additionally, re-election of LGU officials in 2013 will weaken forestry regulation enforcement because officials have paid more attention to being re-elected than to enforcing rules to prevent illegal poaching. This situation creates a more open-access regime, particularly for residual forest areas and the area under the Program for Forest Ecosystem Management. One of the respondents, who lives near a protected zone in the main watershed area, explained the residual forest situation as follows: 'There are fewer trees than before. They are smaller because the mother trees are felled. There was one tree per 3 m × 3 m area before. There is now one tree per 20 m × 20 m area'.

The respondents from the TFM system indicated that there were no internal or external regulations on tree use before 1996. This full range of tree rights without requiring permission from forest authorities allows communities to plant and protect trees through generations to conserve water for rice fields, provide firewood for cooking rice, provide house-building materials, and make woodcarvings. Interviews revealed that no respondent had fewer than 100 trees (Table 2). Individual respondents had on average planted and protected 2,898 pine trees, 1,980 alnos and 1,466 melina. In accordance with muyong resource permit guidelines, cutting pine trees, either planted or wild, is prohibited. Executive Order 23 prohibits cutting premium species. This might be unfair to the Ifugaos because they had been planting and using whatever species they wanted before the government introduced the law.

In the case of communal muyong, an interview with the son of a tribal leader revealed that people observed traditional unwritten rules not only in private muyong but also in the communal area, when he was young. Of 47 % of the respondents whose livelihood is woodcarving, 30 % collect timber from communal and private muyong, while 21 % collect from communal muyong only, 21 % from private muyong only, and 14 % from communal muyong and other provinces. One 70-year-old respondent said that he harvested about five trees at a time from the communal area for woodcarving and planted five trees to replace them. Traditional unwritten rules are likely to be abandoned by younger generations because of urbanization or

Table 3 Average percentage of household annual income per income source

System	Village	N	Average percentage of annual income per income source per household				Total (%)	Total income (pesos)
			Selling crops	Selling charcoal	Selling lumber	Others		
CGIP	A	21	1.1	0.5	0.3	97.7	100	136,054
	B	16	61.0	1.9	0.1	37.0	100	149,491
LGIP	C	13	56.9	3.7	4.0	35.3	100	117,532
	D	13	13.5	0	2.2	84.3	100	151,931
TFM	E	18	29.2	0.3	5.9	64.6	100	113,258
	F	8	0	0	7.9	92.2	100	33,250
	G	3	0	0	3.1	96.3	100	22,666
	H	10	4.4	0	9.9	85.6	100	58,000
	I	9	0	0	0	100	100	45,150

more emphasis on utilization for income. All respondents said that forest resources in the communal area have degraded and trees have become smaller because of continuous cutting.

Impact of Regulations on Economic Conditions

Case studies on two government-initiated programs illustrated that communities have comprehensive rights to crops and fruit trees and there are no regulations imposed on harvesting. Therefore, benefits go directly to the communities although the average percentage of annual income per household differs between the sitios as shown in Table 3. Selling crops is the largest income source for B, C, and E, whereas agroforestry is the main land-use practice. Sitio D has some farm plots which are not plantation forest, so income from crops is larger than in A, where all respondents' plots are planted with trees. It was observed that in TFM crops are planted in very small plots such as 0.002 ha or 0.003 ha, located near rice terraces or areas adjacent to muyong; these are particularly for household consumption, although one respondent of sitio G was found to plant cash crops.

Related to forest trees, there was a *de facto* rule that allowed charcoal for subsistence income in sitio C. Therefore, the income percentage for charcoal (3.7 %) is the highest among the study sites, while sitio A, B and E having 0.5, 1.9 and 0.3 % respectively (Table 3). In addition, 77 % of respondents in sitio C sell lumber in furniture shops for subsistence income because they have no regular income sources, unlike those in A and B.

Communities must seek permission from the authorities for commercial tree harvests. In the context of CGIP, the federation applied for resource use permits for 37 CSC holders and the communal property area in 2010. To guide this harvesting operation, the federation submitted all sets of required documents to the CENRO then the Environmental Management Bureau and Forest Management Bureau of the PENRO and RENRO. Although rules and regulations for implementing CBFMA

issued in 2004 imply that CRMF and the resource-use plan are the basis for issuing an Environmental Compliance Certificate, in reality the initial environmental examination checklist formulated by Environmental Management Bureau is required (DENR 2004). The total cost for processing all requirements for obtaining a permit for 37 CSC holders which applied in 2010 was 53,000 pesos (US \$11,778), including data encoding, inventory, official payment to PENRO-Environmental Management Bureau and travel costs.⁵ Because of the high bureaucratic requirements, the cutting permit was issued 7 months after application, even though it should have been issued within 15 days.

Aside from bureaucratic and technical requirements, harvesting technology crafted at the national level such as DENR-registered chainsaws must be used, buffalos may be used to haul trees, and chainsaws are permitted for converting logs into lumber to reduce the environmental impact of tree harvesting. At the local level, for instance, only 10 buffalos, each of which can only transport 9 or 10 logs per day, are available to hire because there are only a few households which hire buffalos. Therefore, larger trees of 35 cm DBH and above were prioritized for harvest and the actual volume harvested was 35.10 m³ from the total harvestable volume of 500 cm³ (document from Community Environment and Natural Resource Office (CENRO) 2011). Consequently, not all PO members included in inventory lists could obtain cash income from selling timber.

The regulations in LGIP are simple and easy to follow, and PO members can apply for resources use permits individually. There are no technical requirements such as ECC and criteria and indicators. Therefore, the time required (about 1 or 2 weeks) for obtaining permits and processing costs (about 22 \$) is less than in the CGIP, and it would be possible to create more favourable conditions for the flow of forest benefits to communities by DENR legalizing the permits. The records of PGENRO indicated that there are 29 MOA members who applied for cutting permits through PGENRO from 1999 to 2011. Because of the locations of planted trees, DENR does not want to issue permits formally; instead, cutting is verbally approved by PGENRO personnel. One respondent said that because of this informal system they legitimated cutting trees only after securing a certificate from the barangay office without following the guidelines, because the tree growers can sell lumber to furniture shops in the barangay. Some PO members, particularly households which transport lumber to other townships, applied directly to DENR in the name of title land because they were aware that an MOA is not allowed. Therefore, although interviews indicated that sitio E has the largest percentage of income from selling lumber (Table 3), the income is from illegal sources because they are not authorized users.

Insecure harvest rights might affect incentives for future tree planting. One of the past PO presidents, who had harvested trees in 2009, 2010 and 2011, described his experience in this way: 'A National Bureau of Investigation employee wanted to inspect and have a share of timber after hauling the harvested trees, so policy should be clear not only on paper but also in practice, and paying 100 pesos to the barangay office is a large amount for him.' Moreover, one of the PO leaders, who planted

⁵ The exchange rate is 1 US \$ \approx 45 pesos as at 2011.

trees herself, stated: ‘Trees are not planted by the government. I paid 1,000 pesos to DENR to use my harvest rights. It is expensive because I can buy one cavan (about 65 kg) of rice for that amount.’

In the TFM system, people could decide the species and timing of a harvest whenever they needed wood for household consumption, and they could sell without any documents or permission until 1996. Therefore, benefits went directly to the muyong owner, by either selling timber or making woodcarvings, although there is *de facto* control by CENRO over transport permits for finished products. After 1996, the state controlled resource use, and the total processing cost for muyong resource permit is now about \$49. In accordance with the lists of permittees from DENR in Lamut, the CENRO processed the 221 applications for issuing cutting permits from 1996 to September 2011. However, Hangdann (2004) noted that most of the permits issued were for the woodcarving industry or for the livelihoods of those engaged in the forestry industry. In the study area, interviews with woodcarvers indicated that the only people who applied for muyong resource permits were woodcarvers who live near the road and businessmen who transport finished products to other cities. Otherwise people do not want to apply for muyong resource permits because of the cost and time requirements, and because they own the trees. Three of the 30 TFM respondents sold trees and earned 30,000, 5,000 and 80,000 pesos, respectively, based on number of trees, without requiring any permission.

Conclusion and Policy Implications

Although the theory of property rights conceptualized by Schlager and Ostrom (1992) states that the person who holds the collective-choice rights of management and exclusion can devise the operational rights, this precondition is realized only in the TFM system, especially prior to government intervention. Communities in CGIP make collective-choice decisions to devise *de facto* operational rules such as those on charcoal making and on harvesting trees for home consumption and communal use, while *de jure* operational rules for commercial harvest of forest products are defined by the state. In LGIP, operational rules for *de jure* withdrawal rights are defined by the provincial government in line with the local government code, while the communal area of watershed management is controlled by the local government.

Regulations on the use of forest resources have brought about improved forest conditions, but have also limited the flow of forest benefits to communities in CGIP. This is because operational rules defined at the national level involve complex and costly processes to obtain permits which are issued by DENR regional director after checking of the required technical documents by six institutions, and therefore approval takes time. In contrast, if collective-choice decisions are made at the local administrative level, rules are simple and easy to follow because the policy is designed for a particular location. This has to some extent helped improve the flow of forest benefits to communities, but overall forest conditions are likely to degrade because communities are not authorized to control forest resource use at the local level under the co-management strategy. In addition, lack of clarity at the constitutional level

about devolution of cutting permits, and location of planted trees in the case of LGIP, reduced communities ‘authorized users’ to ‘unauthorized users’. Communities have more liberal and more assured rights under TFM, particularly in relation to tree ownership. This has contributed to improved forest condition and income from forest resources because benefits go directly to communities.

The study reveals that one way to promote sustainable forest management is to address property right issues that constraint the flow of forest benefits to the local households and communities. Property right in CGIP could be improved if the CBFM policies defined at the national level were applied at the local level. For example, issuance of cutting permits should strictly follow the prescribed timeframe (in accordance with policy, 15 days), and the CRMF should serve as the basis for issuing environmental compliance certificate. Similarly, cutting permit authorization should be devolved to the PENRO to facilitate communication between PO leaders and the DENR. For the case of LGIP, the policy should be clear not only on paper but also in practice because MOA members are aware that harvesting planted trees is allowed. Insecure harvesting rights discourage tree planting and may lead to informal rule-enforcement institutions, which could lead to excessive harvests because of high local timber demand. For instance, some respondents applied to DENR for cutting permits in the name of title land although it is planted inside the MOA area, while some members were allowed to cut timber after securing a certificate from the barangay office. Therefore, because timber harvesting happens anyway in an unsystematic, ad hoc manner, DENR should issue cutting permits for planted trees when LGUs endorse applications even though the land is a watershed area. In relation to the TFM system, government officials should consider local people’s traditional values and customary practices in the forest because some regulations may be unfair for the Ifugaos because local people had been planting and using diverse indigenous tree species before government law was introduced. Examples of regulations are DENR Memorandum Circular No. 02, which states that planted and wild pine trees are to be preserved (DENR 1996), and Executive Order 23 which prohibits commercial harvesting of premium species.

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